

WHAT IS CLAIMED IS:

1. A capping method which uses a capping head for holding a cap and a motor for rotating the capping head to turn a cap held by the capping head in a clamping direction so that the cap can be clamped to a vessel with a predetermined winding angle, comprising the steps of

measuring a change in a force acting on the cap as distal ends of threads on the cap and the vessel contact each other during the relative rotation of the both threads;

and detecting an incipient position of a meshing engagement where the distal ends of the both threads contact on the basis of the change in the acting force.

2. A capping method according to Claim 1 further comprising the steps of

causing the cap held by the capping head to descend so as to be fitted around a mouth of the vessel;

stopping the descent at an elevation where the distal end of the threads on the cap can abut against the distal end of the threads on the vessel;

causing the cap to rotate until a position is reached where at least the distal ends of the both threads on the cap and the vessel abut against each other while measuring a change in the force acting on the cap under a condition that the descent is ceased;

and detecting a position where an increase occurs in the acting force as an incipient position of meshing engagement where the distal ends of the both threads contact each other.

3. A capping method according to Claim 1 further comprising the steps of

causing the cap held by the capping head to descend so as to be fitted around a mouth of the vessel;

causing the cap to rotate in a direction opposite from the clamping direction until a rotational position is reached where at least the distal end of the threads on the cap is disengaged from the threads on the vessel while measuring a change in the force acting on the cap;

and detecting a position where the acting force has changed from increasing to decreasing as an incipient position of meshing engagement where the distal ends of the both threads contact each other.

4. A capping method according to Claim 1 further comprising the steps of

causing the cap held by the capping head to descend so as to be fitted around a mouth of the vessel;

causing the cap to rotate in the clamping direction until a rotational position is reached where at least the distal ends of the both threads on the cap and the vessel abut against each other with a speed relationship such that the cap rotates through at least one revolution while it descends by a vertical distance corresponding to the width of one of the threads on the vessel while measuring a change in the force acting on the cap;

and detecting a position where a change in the acting force occurs as an incipient position of meshing engagement where the distal ends of the both threads contact each other.

5. A capping method according to one of Claims 1 to 4 in which a rotational load acting on the cap is measured as the acting force.

6. A capping method according to one of Claims 1 to 4 in which a vertical load acting on the cap is measured as the acting force.

7. A capping apparatus including a capping head for holding a cap and a motor for rotating the capping head, the cap held by the capping head being turned in a clamping direction so that the cap can be clamped to a vessel with a predetermined winding angle, the apparatus comprising:

an elevating mechanism for elevating the capping head up and down;

measuring means for measuring a change in a force acting on the cap which is held by the capping head;

angle detecting means for detecting an angular position to which the capping head is rotated;

and control means for controlling the rotation of the motor in response to a result of measurement from the measuring means and an angle signal from the angle detecting means;

the control means being arranged such that in the course of a descent of the capping head to an elevation where a clamping of the cap is to be initiated, it causes the capping head to rotate either forwardly or reversely with respect to the clamping direction to cause distal ends of the both threads on the cap and the vessel to contact each other, the control means detecting an incipient position of a meshing engagement between the both threads where their distal ends contact each other on the basis of a change in the force acting on the cap.

8. A capping apparatus according to Claim 7 in which the elevating mechanism is arranged to cease the descent once in the course of the descent of the capping head to an elevation where a clamping operation of the cap is to be initiated.

9. A capping apparatus according to Claim 7 in which the elevating mechanism and the control means are arranged such that the cap is caused to rotate forwardly with a speed relationship such that at least the cap is rotated through one revolution during the time the cap descends by a vertical distance corresponding to the width of one of the threads of the vessel in the course of the descent of the capping head to an elevation where the clamping operation of the cap is to be initiated.